(FILE 'HOME' ENTERED AT 09:14:20 ON 04 AUG 1997)

FILE 'REGISTRY' ENTERED AT 09:14:30 ON 04 AUG 1997
L1 1 S BETA 1,6 GLUCANASE
SEL L1

FILE 'CA, BIOSIS, WPIDS, USPATFULL' ENTERED AT 09:15:40 ON 04 AUG 1997
L2 88 FILE CA
L3 34 FILE BIOSIS
L4 16 FILE WPIDS
L5 7 FILE USPATFULL
TOTAL FOR ALL FILES
L6 145 S E1-E3
L7 565 FILE CA
L8 1157 FILE BIOSIS
L9 72 FILE WPIDS
L10 72 FILE USPATFULL
TOTAL FOR ALL FILES
L11 1866 S HARZIANUM
L12 6 FILE CA
L13 3 FILE BIOSIS
L14 1 FILE WPIDS
L15 0 FILE USPATFULL
TOTAL FOR ALL FILES
L16 10 S L11 AND L6
L17 6 DUP REM L16 (4 DUPLICATES REMOVED)

=> d ibib ab 1-6

L17 ANSWER 1 OF 6 CA COPYRIGHT 1997 ACS
ACCESSION NUMBER: 126:329588 CA
TITLE: Feed for fish containing biologically available astaxanthin from Phaffia rhodozyma
INVENTOR(S): Robertsen, Boerre; Soerum, Unn; Guddal, Per Henrik
PATENT ASSIGNEE(S): Biotec-Mackzymal As, Norway
SOURCE: Norw., 25 pp.
CODEN: NOXXAJ

	NUMBER	DATE
PATENT INFORMATION:	NO 180664 B	970217
APPLICATION INFORMATION:	NO 94-2631	940713

DOCUMENT TYPE: Patent
LANGUAGE: Norwegian
AB Biol. available astaxanthin from the microorganism P. rhodozyma for the improvement of the color of food products from fish, esp. salmon, crustaceans, or poultry, produced by the lysis of the microbial cell walls with **.beta.-1,6-glucanase**, is claimed. The prodn. of the **.beta.-1,6-glucanase**, esp. from Trichoderma **harzianum**, is also described.

L17 ANSWER 2 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 1
ACCESSION NUMBER: 124:108954 CA
TITLE: Trichoderma beta-(1-6)-endoglucanase cDNA, its

preparation with recombinant cells, and its use in degrading beta-glucans

INVENTOR(S): Kofod, Lene Venke; Andersen, Lene Nonboe; Kauppinen, Markus Sakari; Christgau, Stephan; Dalboege, Henrik; Olsen, Hans Sejr

PATENT ASSIGNEE(S): Novo Nordisk A/S, Den.

SOURCE: PCT Int. Appl., 49 pp.
CODEN: PIXXD2

	NUMBER	DATE
PATENT INFORMATION:	WO 9531534 A1	951123
DESIGNATED STATES:	W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT	
	RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG	
APPLICATION INFORMATION:	WO 95-DK189	950511
PRIORITY APPLN. INFO.:	DK 94-547	940511

DOCUMENT TYPE: Patent

LANGUAGE: English

AB The invention relates to Trichoderma **harzianum** endo-.**beta.**(1-6)-**glucanase**. Further, the invention relates to a DNA construct encoding the enzyme, a method of producing the enzyme, an enzyme prepn. contg. the enzyme, the use of said enzyme or said prepn. for a no. of uses including the degrdn. or modification of beta-glucan contg. materials. The cDNA for Trichoderma **harzianum** endo-**1,6-.beta.-glucanase** was cloned, sequenced, and expressed in Aspergillus oryzae. The enzyme was purified and characterized (mol. wt., pI, pH optimum, temp. optimum, kinetic parameters) and shown to degrade pustulan.

L17 ANSWER 3 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 2

ACCESSION NUMBER: 122:285216 CA

TITLE: Purification and characterization of an endo-.**beta.-1,6-glucanase** from Trichoderma **harzianum** that is related to its mycoparasitism

AUTHOR(S): de la Cruz, Jesus; Pintor-Toro, Jose A.; Benitez, Tahia; Llobell, Antonio

CORPORATE SOURCE: Instituto de Bioquimica Vegetal y Fotosintesis, Universidad de Sevilla, Seville, 41080, Spain

SOURCE: J. Bacteriol. (1995), 177(7), 1864-71
CODEN: JOBAAY; ISSN: 0021-9193

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The enzymes from Trichoderma species that degrade fungal cell walls have been suggested to play an important role in mycoparasitic action against fungal plant pathogens. The mycoparasite Trichoderma **harzianum** produces at least two extracellular .beta.-1,6-glucanases, among other hydrolases, when it is grown on chitin as the sole carbon source. One of these extracellular enzymes was purified to homogeneity after adsorption to its substrate, pustulan, chromatofocusing, and, finally, gel filtration. The apparent mol. mass was 43,000, and the isoelec. point was 5.8. The first 15 amino acids from the N terminus of the purified protein have been sequenced. The enzyme was specific for .beta.-1,6 linkages and showed an endolytic mode of action on pustulan. Further characterization indicated that the enzyme by itself releases sol. sugars and produced hydrolytic halli on yeast cell

walls. When combined with other T. **harzianum** cell wall-degrading enzymes such as .beta.-1,3-glucanase and chitinases, it hydrolyzes filamentous fungal cell walls. The enzyme acts cooperatively with the latter enzymes, inhibiting the growth of the fungi tested. Antibodies against the purified protein also indicated that the two identified .beta.-1,6-glucanases are not immunol. related and are probably encoded by two different genes.

L17 ANSWER 4 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 3
ACCESSION NUMBER: 123:277404 CA
TITLE: Molecular characterization and heterologous expression of an endo-.**beta**.-**1**,**6**-**glucanase** gene from the mycoparasitic fungus Trichoderma **harzianum**
AUTHOR(S): Lora, Jose M.; De la Cruz, Jesus; Llobell, Antonio; Benitez, Tahia; Pintor-Toro, Jose A.
CORPORATE SOURCE: Inst. Recursos Naturales Agrobiol., CSIC, Seville, E-41012, Spain
SOURCE: Mol. Gen. Genet. (1995), 247(5), 639-45
CODEN: MGGEAE; ISSN: 0026-8925
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Hydrolytic enzymes from the filamentous fungus Trichoderma **harzianum** have been described as crit. elements of the mycoparasitic action of Trichoderma against fungal plant pathogens. In this report we describe the first genomic and cDNA clones encoding a .beta.-1,6-endoglucanase gene. The deduced protein sequence has limited homol. with other .beta.-glucanases. Northern expts. show a marked repression of mRNA accumulation by glucose. The protein has been successfully produced in Saccharomyces cerevisiae upon construction of a transcriptional fusion of the cDNA with a yeast promoter. This S. cerevisiae recombinant strain shows a strong lytic action on agar plates contg. .beta.-1,6-glucan.

L17 ANSWER 5 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 4
ACCESSION NUMBER: 118:209167 CA
TITLE: Carbon source control on .beta.-glucanases, chitobiase and chitinase from Trichoderma **harzianum**
AUTHOR(S): de la Cruz, Jesus; Rey, Manuel; Lora, Jose M.; Hidalgo-Gallego, Antonio; Dominguez, Fernando; Pintor-Toro, Jose A.; Llobell, Antonio; Benitez, Tahia
CORPORATE SOURCE: Inst. Bioquim. Veg. Fotosint., Univ. Sevilla, Sevilla, E-41080, Spain
SOURCE: Arch. Microbiol. (1993), 159(4), 316-22
CODEN: AMICCW; ISSN: 0302-8933
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The cell wall-degrading enzymes .beta.-glucanase and chitinase have been suggested to be essential for the mycoparasitic action of Trichoderma spp. against plant fungal pathogens. For this reason, the prodn. on different C sources of extracellular .beta.-1,3-glucanase, .**beta**.-**1**,**6**-**glucanase**, chitobiase, and chitinase was studied in a mycoparasitic strain of T. **harzianum**. Max. .beta.-glucanase sp. activities were detected in media supplemented with either pustulan (.beta.-1,6-glucan), nigeran (.alpha.-1,3-glucan alternating with .alpha.-1,4-glucan), chitin, or Saccharomyces cerevisiae or Botrytis cinerea purified cell walls, whereas the highest chitinase sp. activity was obtained in medium supplemented with chitin. .beta.-Glucanase, chitobiase, and chitinase activities showed an increase parallel to increasing concns. of either pustulan or chitin added to the cultures, although

the extent of this increase varied with the different enzymes. The culture filtrates of T. **harzianum** grown on these sources also showed lytic activity on purified cell walls of S. cerevisiae and B. cinerea. Enzyme synthesis seemed to be repressed by glucose, 8-hydroxyquinoline, which inhibits transcription, or cycloheximide, an inhibitor of protein synthesis.

L17 ANSWER 6 OF 6 CA COPYRIGHT 1997 ACS
ACCESSION NUMBER: 119:155803 CA
TITLE: Regulation of .beta.-1,3-glucanase synthesis in Trichoderma **harzianum**
AUTHOR(S): Rudawska, Maria; Kamoen, Oswald
CORPORATE SOURCE: Inst. Dendrol., Pol. Acad. Sci., Kornik, 62-035, Pol.
SOURCE: Arbor. Kornickie (1992), 37, 51-9
CODEN: ARKOA9; ISSN: 0066-5878
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The antagonistic fungus T. **harzianum** when grown in a synthetic liq. medium produced enzymes with high .beta.-1,3- and low **.beta.-1,6-glucanase** activity. The enzymes were sepd. by Sephacryl-S 200 column chromatog. The .beta.-1,3-glucanase of T. **harzianum** appears to be subjected to a dual regulation, viz., catabolic repression and substrate induction. Glucose had a repressive effect on .beta.-1,3-glucanase activity when the fungus was incubated in a high glucose medium. After removal into a low glucose medium, the catabolic repression persisted for several days. Substrate induction in the culture of T. **harzianum** may be evoked by an exogenously supplied glucan, laminarin. Laminarin stimulated glucanase prodn. only when glucose was completely exhausted. The results are discussed in the context of better understanding of glucanase regulation, which may be helpful for increasing enzyme

L1 ANSWER 1 OF 1 REGISTRY COPYRIGHT 1997 ACS
RN 37228-69-6 REGISTRY
CN Glucanase, 1,6-.beta.- (9CI) (CA INDEX NAME)
OTHER NAMES:
CN **.beta.-1,6-Glucanase**
CN 1,6-.beta.-Glucanase
MF Unspecified
CI MAN
LC STN Files: AGRICOLA, BIOBUSINESS, BIOSIS, CA, CAPLUS, CHEMLIST,
      IFICDB, IFIPAT, IFIUDB, PROMT, TOXLIT, USPATFULL
    Other Sources: EINECS**
        (**Enter CHEMLIST File for up-to-date regulatory information)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
            46 REFERENCES IN FILE CA (1967 TO DATE)